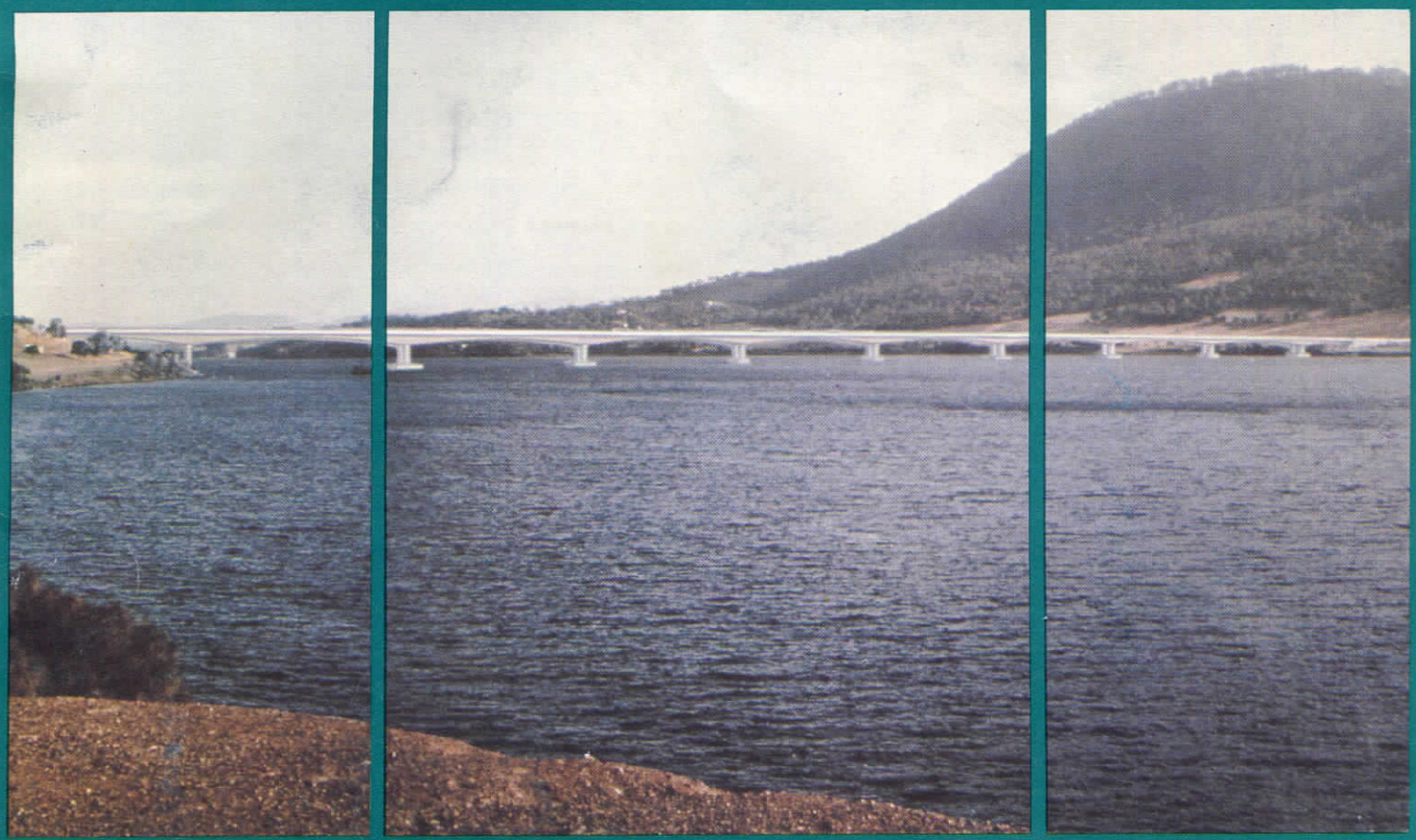
Second Hobart Bridge



THE SECOND HOBART BRIDGE

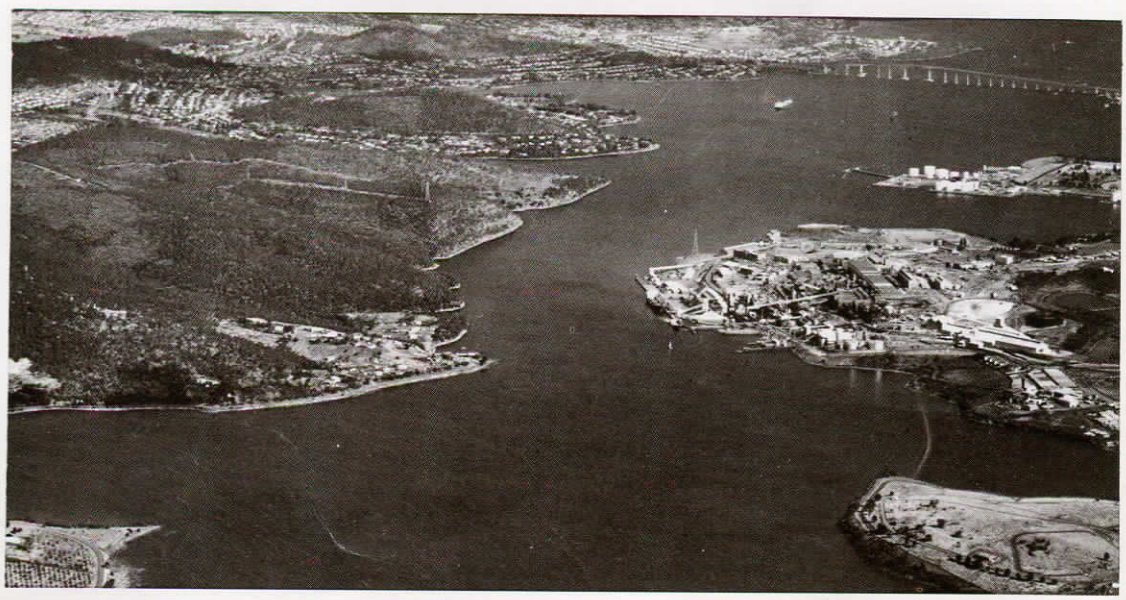
WHY A SECOND BRIDGE IS NEEDED

The vulnerability of the people of Hobart to an extended closure of the Tasman Bridge was dramatically demonstrated by the tragic events of 5 January 1975. The collision of the s.s. 'Lake Illawarra' with the Tasman Bridge and the consequent collapse of the bridge left the people of the eastern shore isolated from the majority of Hobart's community and commercial facilities.

The cost of the disaster has been high, both in economic and social terms. The Commonwealth alone has provided over $45 million to Hobart under the Tasman Bridge disaster arrangements and to this must be added the costs borne by the Tasmanian Government and the people of Hobart.

A second bridge would reduce the economic and social costs caused by any future closures of the Tasman Bridge.

The Commonwealth Government paid for the addition of a fifth lane to the bridge while it was being rebuilt, but this additional capacity is expected to be utilised fully by the mid 1980's. The second bridge will provide sufficient capacity to carry traffic across the Derwent well into the next century.



WHAT THE SECOND BRIDGE WILL DO FOR HOBART

The second bridge will provide a number of other major benefits:

- better access to the eastern shore north of the Tasman Bridge, especially the Brighton, Risdon Vale and North Clarence areas;
- better access to the Glenorchy area for residents of the eastern shore;
- allow more efficient planning of the total Hobart transport network including river transport, the road system and public transport;
- promote more efficient land use and development.

Both the Commonwealth and Tasmanian Governments recognise the need for a second crossing on the Derwent. In March 1975 the then Prime Minister and the Premier of Tasmania established a Joint Committee to supervise the investigations, design and construction of a second bridge. This Committee consists of representatives nominated by both the Commonwealth and Tasmanian Governments.

A number of studies has been carried out to provide information necessary to design and construct the second bridge and to evaluate its impact on future transportation, and the commercial and social needs of the city. They are:

- Development Impact Study
- Traffic Impact Study
- River Transport Study
- Environmental Impact Study
- Road Approach Study
- Economic Evaluation

The detailed design of the bridge has been carried out by Maunsell and Partners Pty Ltd.

WHERE THE SECOND BRIDGE WILL BE BUILT

The Joint Committee examined 18 locations and a number of types of bridge and tunnels. To avoid an excessively expensive bridge, it needs to be located upstream of ocean-going shipping, where foundation conditions are good, and where the river width is at a minimum. On the other hand, travel is best served by having the bridge as far south as possible. The Dowsings Point site is the only one which meets these conditions and, in addition, it is favourably located for the future development of Hobart.

For these reasons the Committee recommended that the proposed bridge be built at Dowsings Point, and both governments have accepted the recommendation.

ENVIRONMENTAL ASPECTS

An Environmental Impact Statement for the construction of a second bridge at Dowsings Point has been prepared in accordance with the provisions of the Commonwealth Environmental Protection (Impact of Proposals) Act, 1974, and the requirements of the Tasmanian Department of Environment. Several alternative plans for the construction of the bridge and its road approaches have been examined and safeguards for the protection of the environment proposed.

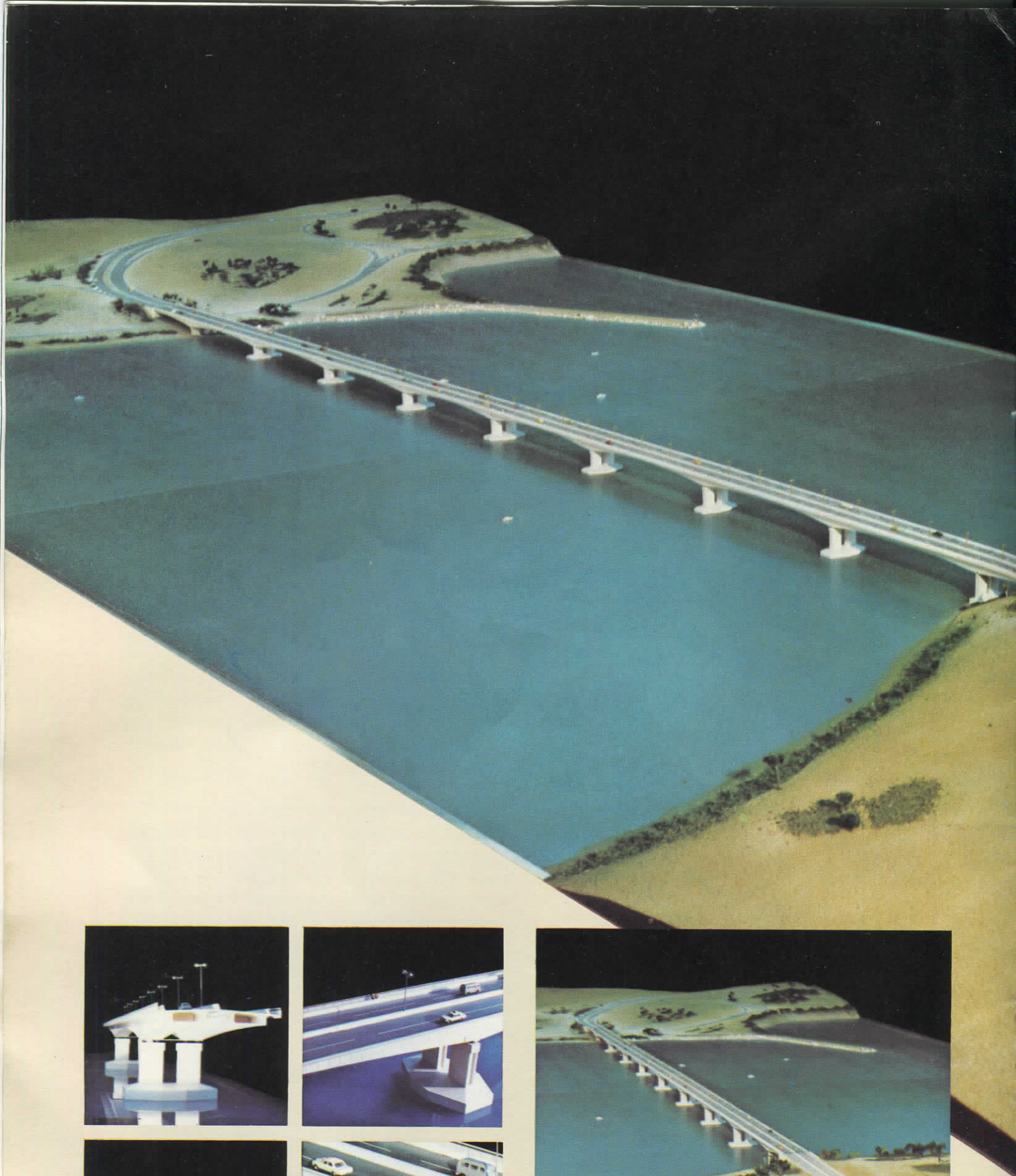
Advice has been obtained by the Joint Committee from Richard Gray, an eminent architectural consultant from England, to ensure that the bridge and its approaches will blend into the surroundings and not detract from the physical, natural, social and historical environment.

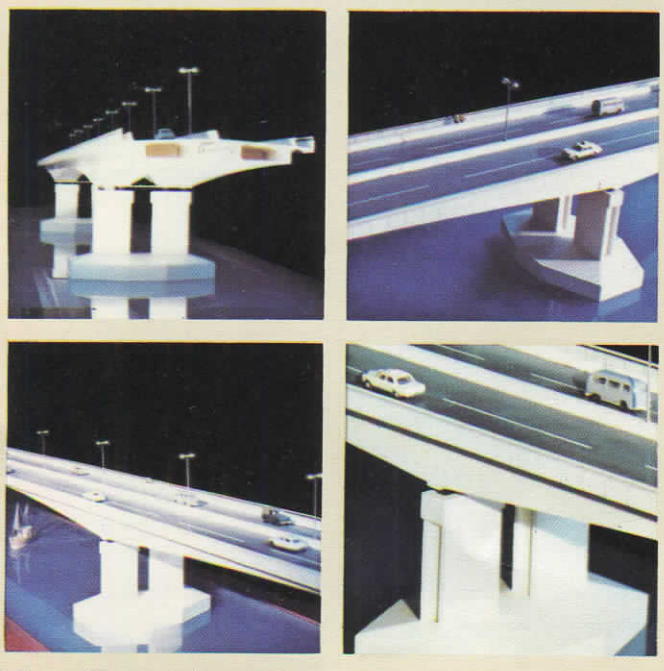
The bridge has been designed so that its visual impact will be in harmony with the existing landscape. It will have a low-profile, wide span design which will fit the setting; the road approaches will be located so that they will be as unobtrusive as possible; careful treatment will be given to the faces of cuttings and embankments; the ultimate road approaches will be designed so that historical Bowen Park will not be affected and measures will be taken during construction to keep the objectionable aspects of this to a minimum.

Decision on the detailed design of the road approaches along Goodwood Road has been deferred until the public has had an opportunity to comment on the various options.

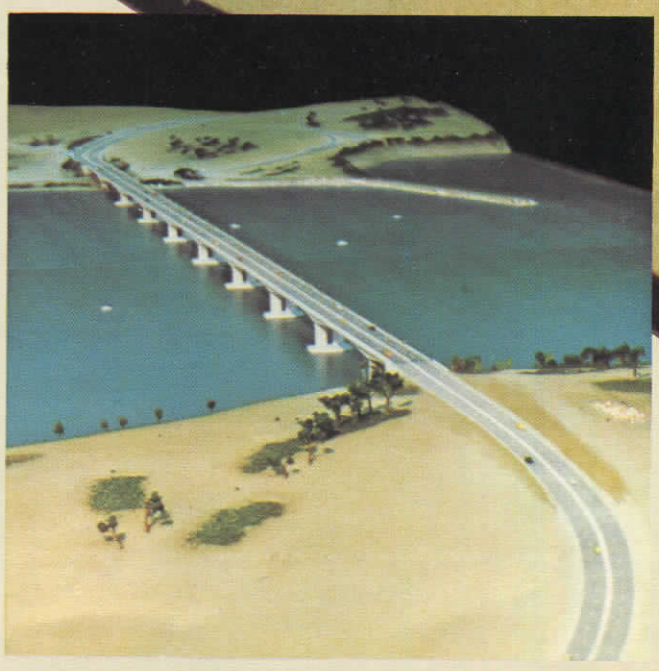
The Environmental Impact Statement also canvasses the land use implications of siting a second bridge at Dowsings Point.

The Environmental Impact Statement is available to the public for comment before final decisions regarding the construction of the bridge are taken.





Views of typical piers and spans



View of the Dowsings Point site

View of a model of the second Hobart bridge looking from Dowsings Point towards Cleburne Point

View from Cleburne Point to Dowsings Point

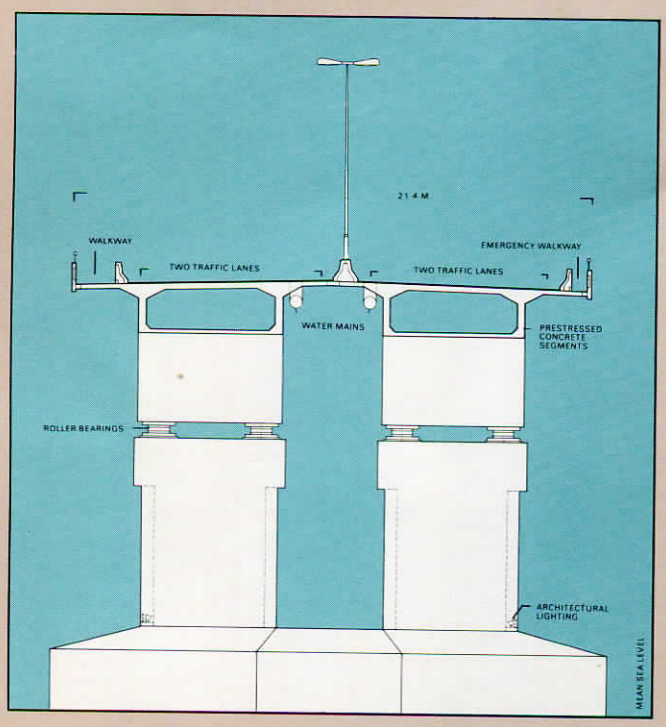
MAIN FEATURES OF THE BRIDGE

The second Hobart bridge is to be approximately 1 kilometre long and have a deck width of 21.4 metres to cater for four lanes of traffic, a median and two walkways, one of which would be suitable for cyclists. The bridge is to be straight in plan and rise on a constant grade of 0.79 percent from east to west.

Design loading will be standard highway loading in accordance with the National Association of Australian State Road Authorities standards, including provision for exceptionally heavy vehicles.

The bridge superstructure will be of prestressed concrete and have eight spans of 109 metres and two shorter end spans. These long spans reduce the number of river piers to seven and provide ample width between piers for all types of river navigation. Because the deep foundations necessary at Dowsings Point are expensive, the long spans and consequent fewer number of piers result in the most economical form of bridge.

Typical Cross Section



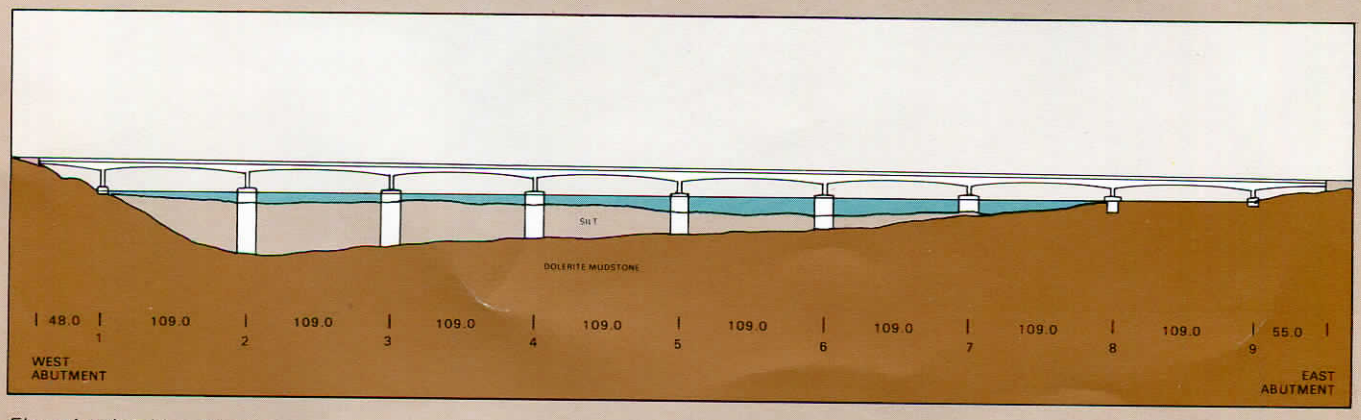
A navigation opening 93 metres wide with a vertical clearance of 15.2 metres over a width of 46 metres will be provided near the centre of the river between piers 4 and 5. Navigational requirements were determined by the River Transport Study. All aspects of navigation through the bridge have been discussed with the Marine Board of Hobart, and comprehensive aids to the passage of vessels will be provided on the bridge and its river approaches.

SUPERSTRUCTURE

The ability to achieve spans of 109 metres in concrete depends on the method of balanced cantilever construction which has been developed and proven over the last 15 years, mainly in Europe. The method involves two balanced cantilever arms built out from each pier in a progressive way by adding segments consecutively to each arm. When mid span is reached there is a small gap to the previously built cantilever arm and this is filled with concrete and the bridge made fully continuous.

The balanced cantilever principle can be applied either by casting the concrete segments in place or by prefabricating match-cast pre-cast concrete segments. The prefabricating or pre-cast method of balanced cantilever construction is a technology not previously used in Australia. Where repetition is involved, this method is generally economical and provides a fast erection rate particularly over water.

The method involves precasting segments of the concrete box girders on shore. The segments are built with their end faces cast one against the other so that a perfect match is achieved and the total alignment of the final structure is pre-determined in the casting yard. After casting, the segments are separated at the match-cast faces and transported individually to the bridge site. The segment is lifted into position and temporarily held while high tensile cables are placed and stressed. Prior to erection, a high strength epoxy glue is applied to the match-cast joint faces and this provides a thin 0.5 mm watertight seal at the joints.



Elevation Looking Upstream

JOINT COMMITTEE

G E C McKercher	*Chairman* *Director, Department of Main Roads Tasmania*
N Sneath	*Deputy Chairman, Chief Structural Engineer* *Commonwealth Department of Construction*
K B Davidson*	*Director of Transportation Planning* *National Capital Development Commission*
B J Donnelly	*formerly Tasmanian Director of Public Works*
N L Lyneham	*Tasmanian State Planning Co-ordinator*
N R Matthews	*Assistant Secretary, Road Projects* *Commonwealth Department of Transport*

*formerly Assistant Secretary, and continuing to represent, the Department of Environment, Housing and Community Development.

EXECUTIVE ENGINEER

E J Bradford	*Planning Engineer* *Department of Main Roads Tasmania*

View of the Dowsings Point site *Photograph : V Reid*

CONSULTANTS

Maunsell & Partners Pty Ltd	*Bridge Design and Site Investigation*
Department of Main Roads Tasmania	*Road Approaches*
Atkins-Meinhardt	*River Transport*
MSJ Keys Young Planners Pty Ltd	*Environmental Impact*
Nicholas Clark & Associates	*Development Impact*
P G Pak-Poy & Associates	*Traffic Impact*
Nicholas Clark & Associates	*Economic Evaluation*
Llewelyn-Davies Kinhill Pty Ltd	*Public Review Programme*

JANUARY 1978
DESIGN/JULIE HAMILTON SYDNEY
PRINTING/MERCURY-WALCH HOBART